

Appln No. 10/020,506

Amdt date June 10, 2003

Reply to Office action of April 9, 2003

REMARKS/ARGUMENTS

The following rejections and objections were made in the Office action of April 9, 2003:

- Claims 60 - 65 were rejected under 35 U.S.C. §112 ¶2 as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention;
- Claims 56 - 61 and 64 - 68 were rejected under 35 U.S.C. §102(e) as being anticipated by U.S. Patent 4,888,247 to Zweben et al. (The Zweben et al. patent);
- Claim 62 was rejected under 35 U.S.C. §103(a) as being obvious in light of the Zweben et al patent;
- Claim 63 was rejected under 35 U.S.C. §103(a) as being obvious in light of the Zweben et al patent and U.S. Patent 5,326,626 to Durand et al. (the Durand et al. patent); and
- Claim 69 was objected to as being dependent upon a rejected base claim.

Claim 56

Claim 56 was rejected under 35 U.S.C. §102 (e) as anticipated by the Zweben et al. patent. The Office actions states that the Zweben et al. patent:

. . . discloses a heat conducting laminate which is laminated to a printed wiring board (Col. 16, lines 10 - 25). The heat

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conducting laminate comprise at least one layer of metal ("the electrically conductive layer") and at least one layer of polymer matrix composite material having low-thermal-expansion reinforcing material distributed throughout and embedded therein ("the carbon containing layer") (Abstract).

Printed wiring boards typically serve the function of establishing electrical connections. However, Zweben et al. teach that:

. . . the particular reinforcing material must not interfere with the electrical properties or any other properties of the electronic components or other type of component in which it is ultimately utilized in the form of a heat transfer device (Col 10, lines 11 - 15).

Therefore, Applicants respectfully submit that the Zweben et al. patent does not teach a printed wiring board on which an electronic device is mounted that includes:

at least one carbon containing layer;
and

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wherein at least one electrical connection exists between the carbon containing layer and the electronic device.

Claims 57 - 59

Claims 57 - 60 depend from claim 56 and are respectfully submitted to be allowable for the reasons stated above.

Claims 60 - 65

Claims 60 - 65 were rejected under 35 U.S.C. §112 ¶2 as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The following statement was made in the Office action:

In claim 60 - 64, it is unclear if the resin is an electrically conductive resin by itself or becomes an electrically conductive resin after addition of the additives listed in claims 62 - 64.

In claim 65, it is unclear how the electrical connection between the carbon containing layer and the electrically conductive layer is established by contact between the carbon in the carbon containing layer and the electrically conductive layer. Since the carbon layer also contains

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electrically conductive resin and the carbon is impregnated with the resin.

Applicants submit that the conductivity of a resin is a function of the various materials and additives used in the composition of the resin. Applicants submit that claims 60 - 64 simply include the limitation that the resin impregnated into the carbon containing layer be "electrically conductive". Claims 62 - 64 include limitations that require particular additives to be present in the resin.

Claim 65 has been amended to clarify that:

an electrical connection between the carbon containing layer and the electrically conductive layer is established by contact between the electrically conductive resin impregnated into the carbon substrate in the carbon containing layer and the electrically conductive layer.

Claim 62 was also rejected as being obvious in light of the Zweben et al. patent. Applicants submit that the Zweben et al. patent does not teach a patent including:

at least one carbon containing layer;
wherein at least one electrical connection exists between the carbon containing layer and the electronic device;

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wherein the carbon containing layer comprises a substrate containing carbon impregnated with a resin; and

wherein the electrically conductive resin contains a pyrolytic carbon additive.

Claim 63 was also rejected for being obvious in light of the Zweben et al. patent and the Durand et al. patent. The Durand et al. patent contains teachings relating to electrically conductive cements that contain silver oxide. Applicants note that the Office action does not indicate the specific teaching in either of the cited prior art references that would motivate one of ordinary skill in the art to construct a printed wiring board that includes "a carbon containing layer" that "comprises a substrate containing carbon that is impregnated with" any of the resins described in the Durand et al. patent. In addition, Applicants submit that the reasons stated above in support of the allowability of claim 56 also support the assertion that prior art cited in the Office action does not teach the limitations of claim 63.

In light of the above comments, Applicants respectfully submit that claims 60 - 65 are in condition for allowance.

Claims 66 - 68

Claims 66 - 68 depend from claim 56 and are respectfully submitted to be allowable for the reasons stated above.

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Claim 69

The previous Office action indicated that claim 69 would be allowed if rewritten in independent form. Applicants have amended claim 69 on account of the amendments to claim 56 and have also amended claim 69 to depend from claim 56. Applicants submit that claim 69 is allowable as none of the prior art of record teaches a printed wiring board on which an electronic device is mounted that includes:

at least one carbon containing layer;
and

wherein at least one electrical connection exists between the carbon containing layer and the electronic device;
and

wherein the electrical connection between the carbon containing layer and the electronic device includes a plated via extending through the carbon containing layer.

Claim 70

Applicants submit claim 70 is allowable as none of the prior art of record teaches a printed wiring board including:

at least one carbon containing layer;
a layer of electrically conducting material;

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a layer of dielectric material;

wherein the layer of electrically conductive material is separated from the layer containing carbon by at least the layer of dielectric material;

wherein the layer of electrically conductive material is patterned with circuit traces;

wherein at least one electrical connection exists between the carbon containing layer and the electronic device;

wherein the electrical connection between the carbon containing layer and the electronic device includes a plated via extending through the carbon containing layer; and

wherein the electrical connection between the carbon containing layer and the electronic device includes a trace on the layer of electrically conductive material that contacts the plated via extending through the carbon containing layer.

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Conclusion

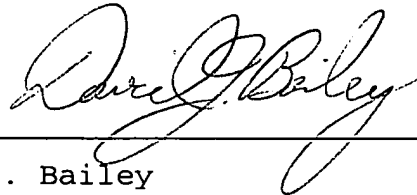
For the reasons stated above, Applicants respectfully submit that all pending claims are allowable and request a notice of allowance at the earliest opportunity. In addition to the reasons stated above, Applicants have enclosed a copy of the preliminary examination report issued by the International Preliminary Examining Authority in relation to an application filed under the Patent Cooperation Treaty ("PCT") based on the above referenced application. Applicants note the similarity of claims 29 - 39 in the PCT case with the claims pending in the above referenced application and the favorable opinion provided in the Preliminary Examination Report in relation to these claims.

Applicants also wish to draw the Examiner's attention to the enclosed document evidencing the limited recognition granted to David J. Bailey under 37 C.F.R. §10.9(b) to practice before the United States Patent and Trademark Office.

Respectfully submitted,

CHRISTIE, PARKER & HALE, LLP

By



David J. Bailey

Limited Recognition Under 37 CFR 10.9(b)

626/795-9900

DJB/mlm